United States Department of Agriculture

NRCS

Natural Resources Conservation Service, 100 USDA, Suite 206, Stillwater, OK 74074-2265 (405) 742-1256

January 26, 2004

OKLAHOMA BULLETIN NO. OK210-4-4

SUBJECT: ENG – Changes in Sizing of Dry Stack/Composter and Cakeout Storage Structures.

Purpose: To provide guidance on sizing dry stack/composter and cakeout storage structures with rear door openings.

Expiration Date: September 30, 2004

Based on several requests from the field to have an opening without a door located at the rear end of the building of waste storage structures, changes are being made that will increase the length of the structure to account for the loss of stacking floor space. This bulletin clarifies the design length required for dry stack/composter and cakeout storage facilities for the use of Oklahoma's conservation practice standard for Waste Storage Facility (313) and Compost Facility (317) with cakeout storage.

If the structure is built without an opening on the rear end of the building, no changes will be made to the original design procedure.

If the structure has a rear opening without a door, 6 feet of non-stackable space will be required in order to prohibit rain from falling on the litter stacks. In addition to the 6 feet of non-stackable area, the 5 feet high litter stack will slough from 5 feet to the floor in a horizontal distance of 3.75 feet. With the decrease in available volume of storage, an additional volume must be added resulting in an increase to the overall length of the structure. The formula for calculating the volume of litter storage lost due to having a rear opening without a door is:

183 + (39.375 x W) = ____ CF of litter volume, where W = width of door opening

For a standard 39 ft. building width: ____ CF / (39x5) = ____ Ft., increased length of building

If the structure has a rear opening with a door, litter may not be stacked directly against the door. With a sloughing distance of 3.75 feet from the door, litter can be stacked 5 feet in height. The formula for calculating the volume of litter loss due to having a rear opening with a door is:

70.3 + (9.375 x W) = ____ CF of litter volume, where W = width of door opening

For a standard 39 ft. building width: ____ CF / (39x5) = ____ Ft., increased length of building

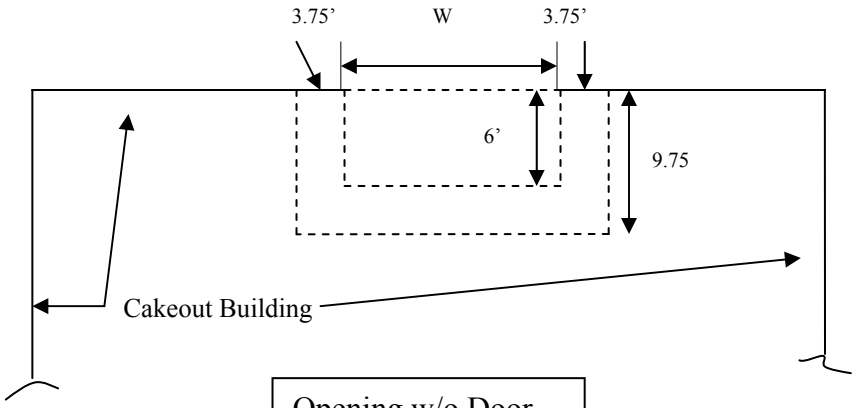
See attachment for analysis. If there are questions concerning these items, please contact your Resource Engineer.

/s/ Leslie R. Conner Acting for:

M. DARREL DOMINICK
State Conservationist

Attachment

DIST: AE



Opening w/o Door

Total Volume - @ 5 ft. stack height.

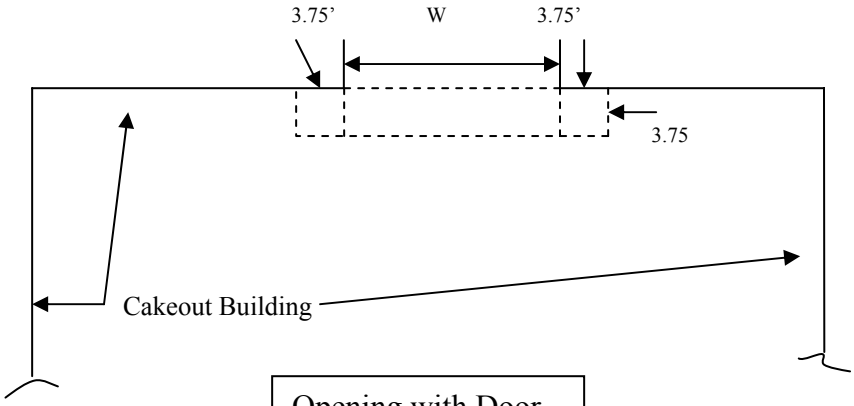
Vtotal = (3.75 x 2 sides) (9.75 x 5 stack ht) = 365.6 cf + door width (W) volume

Less slough: Vs = (3.75 x 2 sides) (9.75 x 5/2) = 182.8 + door width volume

365.6 – 182.8 = 182.8, say 183 cf

Vopening: V_L = (6 x L x 5 stack ht) + ½(3.75 x 5 x W) = 30W +9.375W = 39.375W

Total Loss: = 183 + 39.375W



Opening with Door

Vtotal = (3.75 + 3.75 + W) (5/2 x 3.75) = (7.5 + W) (9.375) = 70.3 + 9.375W

Total Loss = 70.3 + 9.375W